SPARK-X

Night Vision Goggles

USER'S MANUAL

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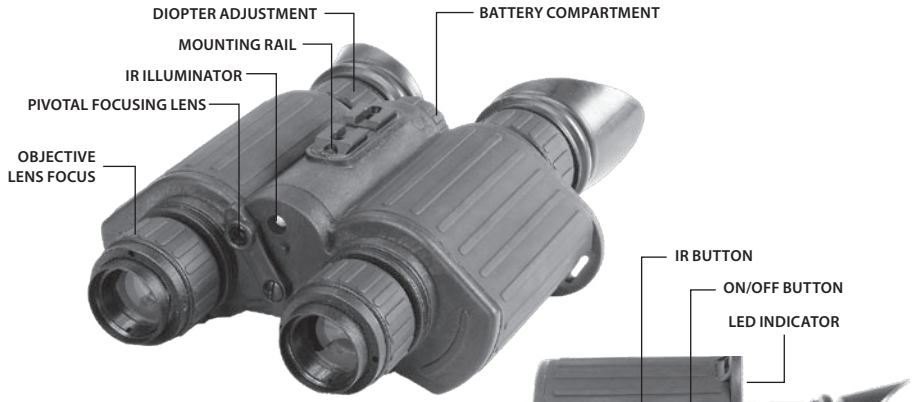
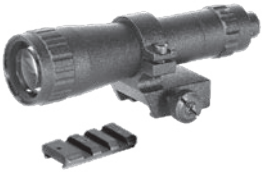
PARTS OF THE GOGGLES



FLIP-UP HEAD MOUNT
(INCLUDED)

OPTIONAL FLIP-UP HELMET MOUNT
(PART# ANHM000002)



OPTIONAL IR810
DETACHABLE LONG RANGE
IR ILLUMINATOR
W/DOVETAIL TO WEAVER
TRANSFER PIECE #21
(PART# ANKI000016)

OPTIONAL IR810W
DETACHABLE WIDE ANGLE
ADJUSTABLE X-LONG RANGE
IR ILLUMINATOR W/DOVETAIL
TO WEAVER TRANSFER PIECE #21
(PART# ANKIW00016)

CAUTION:

This product contains natural rubber latex which may cause allergic reactions! FDA has noted an increase in the number of deaths reported to the agency that are associated with an apparent sensitivity to natural latex proteins. If you are allergic to latex, it is a good idea to learn which products contain it and strictly avoid exposure.

We provide the information in this manual for familiarization purposes only. The contents may undergo further changes with no commitment by Armasight to keep customers notified about any updates.

Armasight assumes no responsibility for any misprints or other errors that this manual may contain.

1. DESCRIPTION AND DATA

DESCRIPTION

Armasight Spark-X is the binocular night vision goggle system built around CORE (Ceramic Optical Ruggedized Engine) image intensifier tubes. Unlike Gen 1 Image intensifier tubes, which are fragile because they are made from glass, CORE™ IITs are made just like Gen 2 and Gen 3 - by fusing metal alloys with ceramic compounds. CORE™ technology is based on durable elements and allows tight component stacking, resulting in image tubes that are exceptionally shockproof and vibration-resistant. Robust packaging protects easy-to-break protrusions common in Gen 1 tubes, and allows for a streamlined design that is lighter, more compact, and more reliable than average night vision devices.

The CORE™ platform offers 'best in class' resolution with up to 70 lp/mm and an increased photocathode sensitivity level of upwards of 400µm/lm, providing high image quality even in difficult ambient light conditions, rivaling high-end Gen 2 image tubes.

The Armasight Spark-X utilizes two CORE image intensifier tubes. This dual tube design provides increased depth perception and outstanding clarity. The Armasight Spark-X comes complete with headgear, which allows the unit to be mounted for hands-free operation.

FEATURES

- **High resolution CORE image intensifier tube**
- **Compact and lightweight**
- **Designed for hands-free operations**
- **Built-in IR illuminator with pivotal lens to select between IR spot and flood beam**
- **Fully adjustable headgear for ultimate comfort**
- **Flip-up headgear**
- **Dual-eye viewing system for comfortable nighttime operation, even during long sessions**
- **Can be used in conjunction with long-range IR Illuminator**
- **Water and fog resistant**
- **Limited two-year warranty**

SPECIFICATIONS *

Image Intensifier Tube	CORE Technology
Magnification	1x
Objective lens diameter (mm)	20.6
Lens system	35 mm; F/1.7
Field of view (°)	30
Focus range (m)	0.25 to infinity
Exit pupil diameter (mm)	8
Eye relief (mm)	20
Power Supply	CR-123 Lithium (1) 3V
Battery life (hour)	up to 40
Body material	Glass-fiber reinforced composite
Lens material/type	Multicoated heavy glass
Operating temperature (°C)	-40 to +50
Dimensions (LxWxH, mm/in)	161 x 142 x 63 / 6.3 x 5.6 x 2.5
Weight (kg/lbs)	0.75 / 1.65

** Armasight© reserves the right to modify these specifications at any time without notice.*

*** Any CR123 type rechargeable batteries with voltage 3.0V can be used.*

STANDARD COMPONENTS AND OPTIONAL EQUIPMENT

1) Armasight Spark-X Goggles

Night vision goggles with 1x magnification.

2) Objective Lens Caps

The Objective Lens Caps are designed to protect the objective lens from physical damage, as well as allow the testing of the device's operation in daylight.

3) Eye Cups

The rubber eye cups are designed to protect the eyepieces and to provide comfortable use.

4) CR123A Lithium Battery

3V CR123A lithium batteries are used to supply power to the unit.

5) Head Mount

Adjustable universal assembly that secures the goggles to the user's head, providing hands-free operation.

6) User Manual

The user manual contains a full description of the device and accessories, information about controls, installation, maintenance and troubleshooting procedures.

7) Carrying Case

The carrying case is used to store and carry the Spark-X goggles and accessories.

8) Optional Helmet Mount (Part# ANHM000002)

Extra long-range infrared illuminator. Provides greater viewing capabilities when the environment has little or no ambient light. Completed with Dovetail to Weaver Transfer Piece that allows the IR illuminator to be mounted on the Spark-X.

9) Optional IR810 Detachable Long Range Infrared Illuminator with Dovetail to Weaver Transfer Piece #21 (Part# ANKI000016)

Long-range infrared (IR) illuminator. Provides greater viewing capabilities when the environment has little or no ambient light. Completed with Dovetail to Weaver Transfer Piece that allows the IR illuminator to be mounted on the Spark-X.

10) Optional IR810W Detachable Wide Angle Adjustable X-Long Range Infrared Illuminator with Dovetail to Weaver Transfer Piece #21 (Part# ANKIW00016)

A detachable LED extra-long-range IR illuminator with a wide, adjustable beam angle (2°-30°). Should be used when there is little to no ambient light. Completed with Dovetail to Weaver Transfer Piece that allows the IR illuminator to be mounted on the Spark-X.

2. PREPARATIONS FOR OPERATION

CAUTION:

The Spark-X night vision goggles are designed for several years of reliable service. To ensure trouble-free performance, please observe the following instructions:

- Do not activate the device in daylight unless the protective lens covers are fitted securely over the lenses. If the device is ON, do not direct the device at bright light sources, such as car headlights, camp fires, street lights, etc., as this will cause damage to the device.
- Do not check the device operation in daylight unless the front lens caps are fitted securely over the lenses, and even then, the device should only be ON for the few seconds it takes to establish correct operation.
- Do not open the body of the device or otherwise disassemble it.
- Avoid dropping or otherwise impacting the device.

- Do not expose the device to moisture or extreme temperatures.
- Do not touch the lenses. Clean optical parts with a clean, soft cloth, and use only professional lens cleaners designed for use with optics.
- Do not forget to turn the device OFF during the periods of non-operation.
- Do not forget to remove the battery from the battery compartment if the device is to be stored for **more than 3 days**.

NOTES:

Take into consideration the following information and restrictions in order to avoid damaging the device and to ensure a long service life and failure-free operation:

- Performance of the device in nighttime conditions depends on the level of ambient light in the environment. Some light (moonlight, starlight, etc.) is required for the device to provide an image.
- Ambient light level is reduced by the presence of clouds, shade, or objects that block natural light (buildings, trees, etc.).
- The device loses its effectiveness when operated in shadowed areas.
- The effectiveness of the device is adversely affected by weather conditions such as rain, snow, sleet, or fog, and environmental conditions such as smoke or dust.
- The device resolution level is reduced in environments with very low light sources. The visibility will degrade significantly under starlit conditions, particularly in low contrast environments such as deserts, large areas of uniform vegetation, etc.

BATTERY INSTALLATION

1) Unscrew the battery compartment cap on the back side of the goggles body.

2) Insert the CR123A battery into the battery compartment in accordance with polarity markings.

3) Screw the cap onto the place.

ATTACHING THE SPARK-X TO A HEAD MOUNT

To attach your Spark-X to a head mount perform the following steps:

1) Loosen the screw (A), press the button (B), and put the binocular rail into the headset socket (C).

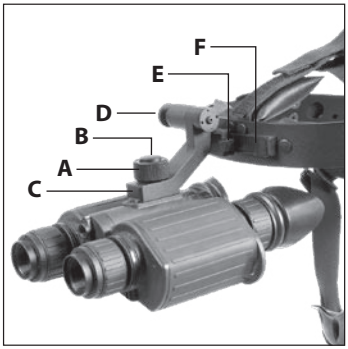
2) Put the head mount, with the Spark-X attached, on your head.

3) Loosen the screw (A) and perform an eye relief adjustment by moving the binocular on the rail.

4) The head mount intended for use with the Spark-X is fitted with a flip-up mechanism. Press the button (D) from the head mount side and lift the binocular to the top position.

5) To return the unit back to the operating position, press the button (D) again and lower the binocular.

6) Press the button (E) and move the binocular on the rail (F) to reach the most comfortable position for observation.



3. OPERATION INSTRUCTIONS

CONTROLS

The Spark-X is designed to meet the needs and requirements of various users. Each user can individually set the unit to the most desirable and effective position with the help of the controls. The Spark-X unit controls and indicators are shown and detailed further, below:

ON/OFF Button. Press the button to turn the unit **ON**. Press the button again to turn the unit **OFF**.

IR Button. This button controls the power supply to the built-in infrared illuminator. Use this button to turn the IR illuminator on and off. The IR will also turn off automatically when the unit is switched off.

Lens Focus. Focuses the objective lens. Adjust the lens for sharpest image of viewed object.

Diopter Adjustment. Focuses the eyepieces. Focus the eyepieces to get a clear image on the IIT screen.

Pivotal Focusing Lens. Allows the user to choose between the following:
1. The IR illuminator spot beam. The pivotal focusing lens is placed onto the IR illuminator output window.
2. The IR illuminator flood beam. The pivotal focusing lens does not cover the IR illuminator output window.

Power/IR ON Indicator. The LED indicator located near the ocular will light up green when unit is on, and will change to red when built-in IR illuminator is activated.

Low Battery Indicator. The flashing red LED indicates that the battery is low.

TESTING PROCEDURES

CAUTION:

Do not test the device in daylight conditions for more than 10 minutes, even with lens protective cap on.

To check device operation in daylight or in an illuminated room observe the following procedures:

1) Verify that the battery is inserted into the battery compartment in accordance with polarity markings on the goggles' body.

2) Verify that the objective lenses are closed securely.

3) Activate the unit by pushing the ON/OFF button, but **without** removing the protective caps. While looking through the eyepieces of your Spark-X, observe the scene. Verify whether or not the green light is indicating that correct IIT operation is occurring.

FOCUSING

1) Adjust the diopters. For the best possible image resolution, you must first adjust the eyepieces (diopters). Turn the diopter adjustment rings clockwise until it stops. While looking through the eyepieces, observe the scene and slowly begin turning the diopter adjustment rings counterclockwise until the image becomes clear and sharp.

2) Adjust the focus of the lenses. To focus your Spark-X at different distances, simply rotate the objective lens focus rings.

OPERATION IN NIGHTTIME CONDITIONS

CAUTION:

Avoid exposing the goggles to bright light sources. Bright light emitted by fires, automobile headlights, lanterns, projectors, etc. will seriously damage your Spark-X.

1) Visually estimate the illuminance level in the viewing area. Operation with the objective lens caps off is safe when the illuminance level is less than 1 lux (at an illuminance level of 1 lux, you will barely be able to read a newspaper, even after your eyes have adapted to the low light conditions).

2) Verify that the battery is inserted into the battery compartment in accordance with the polarity markings on the goggles' body.

3) Remove the front lens caps.

4) Activate the unit by pushing the ON/OFF button. A green light indicating correct IIT operation will appear after a momentary delay.

5) Observe the scene and focus your Spark-X.

6) Turn the unit off after completing your operations. The green glow will disappear from the eye-pieces.

7) Securely place the objective lens caps over the objective lenses.

IR ILLUMINATOR OPERATION

CAUTION:

Do not forget that light emitted from the IR illuminator is invisible to the naked eye; however, it can be easily detected when using night vision devices.

Infrared illuminators are used in areas where the level of light is not sufficient for surveillance. An IR illuminator can provide an extra source of infrared light, which, although invisible to a naked eye, can greatly enhance the performance of night vision devices. Turn on the IR illuminator when working in total darkness. Please remember that the beam emitted by your IR illuminator will lose its brightness over distance. The built-in IR illuminator is designed to provide additional source of light for reading maps or other basic, short-range applications; the viewing distance is up to 3m.

You can activate the IR illuminator of your goggles by pushing the IR button after you've turned the unit on. A red LED light will appear when the IR illumination is turned on. Press the IR button again to turn the illuminator off.

NOTE:

The IR will automatically turn off when the unit's main power is turned OFF.

Focus the IR light, if necessary, by placing the pivotal focusing lens onto the IR illuminator output window.

OPTIONAL IR810/IR810W LONG-RANGE IR ILLUMINATOR

IR810/IR810W long-range infrared illuminator provides greater viewing capabilities when the environment has little or no ambient light.

To mount a Long Range Infrared Illuminator to the Spark-X, use the Dovetail to Weaver Transfer Piece. Perform the following steps:

1) Unscrew the fixing screw on the transfer piece.

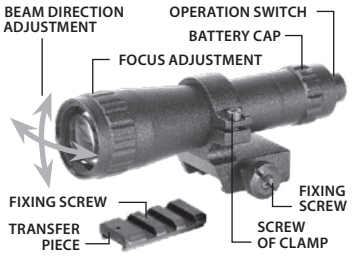
2) Install the transfer piece onto one of the Spark-X rails.

3) Tighten the fixing screw on the transfer piece.

4) Loosen the IR illuminator fixing screw.

5) Mount the IR illuminator on the Weaver rail of transfer piece and tighten the illuminator fixing screw.

The Armasight IR810/IR810W runs on a single CR123A battery. To install the battery, unscrew the battery compartment cap and insert the battery in accordance with



the polarity markings on the unit's body. Screw the battery compartment cap back into position.

To turn the IR illuminator on, rotate the operation switch from the OFF position.

To adjust the power and brightness of the beam emitted by the IR illuminator, rotate the illuminator operation switch.

Focus the IR beam to change the field of coverage. To focus the beam, rotate the IR illuminator lens until the image becomes clear.

Adjust the IR spot position in the field of view of the Spark-X as follows:

1) Loosen the screw of the clamp on the IR illuminator mount.
2) Turn on the night vision device and the IR illuminator.
3) Carefully move the lens of the IR illuminator up and down and side to side. While looking through the eyepieces of your device, observe the IR spot position.
4) Tighten the fixing screw of the clamp once the IR spot is centered in the field of view.

4. MAINTENANCE PROCEDURES

The Spark-X should always be stored in the supplied packaging, particularly in heated and ventilated rooms. To keep the device operational, please follow the instructions listed previously regarding preparations for storage. The battery should be stored separately from the device and be inserted into the battery compartment **only** when the device is being prepared for use. The presence of both acids and alkalis near the goggles is not recommended.

When stored, your Spark-X should be protected from exposure to direct sunlight or extreme temperatures.

GOGGLES CLEANING PROCEDURES

1) Gently remove any dirt from the goggles using a clean, soft cloth.
2) Wipe external surfaces down (with the **exception** of optical surfaces) with a clean cloth moistened with pure water.
3) Dry all wet surfaces with a different clean, dry cloth.
4) Carefully remove any dirt from the optical surfaces using a lens brush.
5) To avoid scratches, optical surfaces must be cleaned using a clean cotton swab that has been slightly dampened with pure alcohol. The glass should be wiped in circular motions starting from the center and moving out towards the edge, without touching the barrel. Change the cotton swab as soon as it becomes dirty.

PREPARATION FOR STORAGE

When preparing your Spark-X for storage, perform the following steps:

1) Verify that the goggles are operating in accordance with all previously specified procedures.
2) Remove the battery from the battery compartment.
3) Clean the goggles and all accessories.
4) Place all components into the storage case.

5. TROUBLESHOOTING

Common problems that may occur with your goggles or the detection and viewing tests, as well as actions you can take to correct them, are listed in the Troubleshooting Table below. **This table does not list all of the malfunctions that may occur with your device.** If you experience a malfunction of the device that is not listed in this table, please contact Armasight or your Spark-X retailer.

NOTE:
Before you use this table, be sure you have performed all normal operational safety, care and handling checks and procedures. If your device malfunctions in a way not listed in this table, contact Armasight or your Spark-X retailer.

TROUBLESHOOTING GUIDE

PROBLEM	POSSIBLE CAUSE	ACTION
The goggles do not turn on	Press the ON/OFF button.	Press the ON/OFF button repeatedly.
	Inspect for a missing, defective or improperly installed battery.	Replace the battery or install it properly
If these actions fail, submit the device for unit level maintenance.		
Poor image quality	Check if the goggles are focused.	Focus the oculars and objectives.
	Check if the lenses are greasy, fogged or dirty.	Thoroughly clean the surfaces of each lens.
If the problem persists, contact your service center.		
Light visible through the eyecups	Check the exit pupil distance value.	Press the eyecups to your face.
	Check the eyepieces resilience.	If the eyecups are defective, contact your service center.
Diopter adjustment cannot be performed	Check to see if the diopter adjustment rings are deformed or broken.	If the diopter adjustment rings are damaged, contact your service center.
Lens focus cannot be performed	Check to see if the lens focus adjustment ring is deformed or broken.	If the lens focus adjustment ring is damaged, contact your service center.
IR illuminator does not switch on	Turn the IR illuminator on in dark area. Visually estimate if the observed scene is properly lighted.	If the IR illuminator does not turn on, contact your service center.

6. WARRANTY INFORMATION

This product is guaranteed to be free from manufacturing defects in material and workmanship under normal use for a period of two (2) years from the date of purchase. In the event that a defect covered by the below warranty occurs during the applicable period stated above, Armasight, at its discretion, will either repair or replace the product; such action on the part of Armasight shall be the full extent of Armasight's liability, and the Customer's sole and exclusive reparation. This warranty does not cover a product if it has (a) been used in ways other than its normal and customary manner; (b) subjected to misuse; (c) subjected to alterations, modifications or repairs by the Customer or by any party other than Armasight without prior written consent of Armasight; (d) special order or "close-out" merchandise or merchandise sold "as-is" by either Armasight or the Armasight dealer; or (e) merchandise that has been discontinued by the manufacturer and either parts or replacement units are not available due to reasons beyond the control of Armasight. Armasight shall not be responsible for any defects or damage that in Armasight's view are a result from the mishandling, abuse, misuse, improper storage or improper operation of the device, including use in conjunction with equipment that is electrically or mechanically incompatible with, or of inferior quality to the product, as well as failure to maintain the environmental conditions specified by the manufacturer. CUSTOMER IS HEREBY NOTIFIED THAT OPERATION OF THE EQUIPMENT DURING DAYLIGHT HOURS OR UNDER ANY EXCESSIVE LIGHT CONDITIONS MAY PERMANENTLY DAMAGE THE INTERNAL COMPONENTS OF THE UNIT AND SAID DAMAGE WILL NOT BE COVERED UNDER THIS WARRANTY. This warranty is extended only to the original purchaser. Any breach of this warranty shall be enforced unless the customer notifies Armasight at the address noted below within the applicable warranty period.

The customer understands and agrees that except for the foregoing warranty, no other warranties written or oral, statutory, expressed or implied, including any implied warranty of merchantability or fitness for a particular purpose, shall apply to the product. All such implied warranties are hereby and expressly disclaimed.

LIMITATION OF LIABILITY

Armasight will not be liable for any claims, actions, suits, proceedings, costs, expenses, damages or liabilities arising out of the use of this product. Operation and use of the product are the sole responsibility of the Customer. Armasight's sole undertaking is limited to providing the products and services outlined herein in accordance with the terms and conditions of this Agreement. The provision of products sold and services performed by Armasight to the Customer shall not be interpreted, construed, or regarded, either expressly or implied, as being for the benefit of or creating any obligation toward any third party of legal entity outside Armasight and the Customer; Armasight's obligations under this Agreement extend solely to the Customer. Armasight's liability hereunder for damages, regardless of the form or action, shall not exceed the fees or other charges paid to Armasight by the customer or customer's dealer. Armasight shall not, in any event, be liable for special, indirect, incidental, or consequential damages, including, but not limited to, lost income, lost revenue, or lost profit, whether such damages were foreseeable or not at the time of purchase, and whether or not such damages arise out of a breach of warranty, a breach of agreement, negligence, strict liability or any other theory of liability.

ARMASIGHT PRODUCT WARRANTY REGISTRATION CARD

PRODUCT INFORMATION

Product Name _____ Purchased From _____

Purchase Date _____ Product Serial # _____

CUSTOMER INFORMATION

Name _____

Address _____

City _____ Country _____ Zip _____

Day Phone # _____ Home Phone # _____

E-mail address _____

Customer Signature Required

PRODUCT WARRANTY REGISTRATION

In order to validate the warranty on your product, Armasight must receive a completed Product Warranty Registration Card for each unit, or the Customer can complete a warranty registration on our website, at www.armasight.com. Please complete the included form and immediately mail it to our Service Center:

Armasight Inc.
815 Dubuque Avenue
South San Francisco
CA 94080
United States of America.

OBTAINING WARRANTY SERVICE

To obtain warranty service on your unit, the End-user (Customer) must notify the Armasight service department via email. Send any requests to service@armasight.com to receive a Return Merchandise Authorization number (RMA). When returning any device, please take in the product to your retailer, or send the product, postage paid and with a copy of your sales receipt, to Armasight Corporation's service center at the address listed above. All merchandise must be fully insured with the correct postage; Armasight will not be responsible for improper postage or merchandise that becomes lost or damaged during shipment. When sending product back, please clearly write the RMA# on the outside of the shipping box. Please include a letter that indicates your RMA#, the Customer's Name, a Return Address, reason for the return, Contact information (valid telephone numbers and/or an e-mail address), and proof of purchase that will help us to establish the valid start date of the warranty. Product merchandise returns that do not have an RMA# listed may be refused, or a significant delay in processing may occur. Estimated Warranty service time is 10-20 business days. The End-user/ Customer is responsible for postage to Armasight for warranty service. Armasight will cover return postage/ shipping after warranty repair to the End-user/ Customer only if the product is covered by the aforementioned warranty. Armasight will return the product after warranty service by domestic UPS Ground service and/ or domestic mail. Should any other requested, required or international shipping methods be necessary, the postage/ shipping fee will be the responsibility of the End-user/ Customer.

Armasight Inc.

815 Dubuque Avenue
South San Francisco
CA 94080, USA

Phone: (888)959-2259
Fax: (888)959-2260
Intl Phone/Fax: (650)492-7755

info@armasight.com

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This product contains natural rubber latex which may cause allergic reactions! FDA has noted an increase in the number of deaths reported to the agency that are associated with an apparent sensitivity to natural latex proteins. If you are allergic to latex, it is a good idea to learn which products contain it and strictly avoid exposure.

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